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## PATENT SPECIFICATION (11)

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## (54) A HEAD-REST

(71) We, GEBRÜDER HAPPICH G.m.b.H.,  
 a German Body Corporate, of Neuenteich  
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 Federal Republic, do hereby declare the  
 invention, for which we pray that a patent  
 may be granted to us, and the method by  
 which it is to be performed, to be partic-  
 ularly described in and by the following  
 statement:—

This invention relates to a head-rest for  
 fitting to the back rest of a seat in a vehicle.

There are various known types of head-  
 rest which are fitted to the back rest of  
 a seat in a vehicle. The simplest type is  
 vertically adjustable only, whereas the more  
 sophisticated types of head-rest can also  
 pivot to a limited extent around a hori-  
 zontal axis. Both types, however, have a  
 common feature in that they are made up  
 of a number of parts and are therefore quite  
 expensive to construct. For example, in the  
 case of known head-rests, the supporting  
 rod has to be secured to an insert and the  
 insert has to be padded. Usually, however,  
 the insert cannot be manufactured in one  
 piece. It is usually made of sheet steel and  
 has to be manufactured from a number of  
 blanks, which are shaped and secured to-  
 gether by spot welding or the like. A further  
 operation is required for securing the insert  
 to the supporting rod, and pivot bearings  
 have to be manufactured and mounted in  
 the case of pivotable padded members. The  
 insert is embedded all around in padding,  
 which also has to have an expensive, sewn  
 lining. It is also known to provide a rotated  
 foamed skin for the padding. If this results  
 in any unsound or collapsed parts, which  
 impair the external appearance of the padded  
 member, the entire head-rest has to be dis-  
 carded. About half the total cost of known  
 head rests is for manufacturing and fitting  
 together the insert, the remaining half being  
 for padding.

An aim of the present invention therefore  
 is to provide a head rest which is formed  
 without an insert and is particularly simple  
 and inexpensive to manufacture. Another  
 aim is to provide a head rest which has a

pleasant appearance and, more particularly,  
 fulfils safety requirements in the optimum  
 manner.

To this end, the invention is directed to  
 a head rest for fitting to the back rest of  
 a seat in a vehicle comprising a padded  
 member constituting the front part of the  
 head rest, a unitary concave supporting  
 member constituting the back part of the  
 head rest, the concavity of the supporting  
 member facing the padded member, a groove  
 around the back of the padded member in  
 which the front edge of the supporting  
 member is received, means securing the  
 padded member to the supporting member,  
 and a supporting rod received by the sup-  
 porting member by which the head rest is  
 supported.

As a result of these features, the head rest  
 is substantially of two-part construction,  
 while the supporting rod, which is required  
 in principle, is preferably vertically adjust-  
 able and is disposed on the back rest of  
 a seat in a vehicle. In the construction  
 according to the invention, the supporting  
 member takes over the mechanical func-  
 tions of the insert, which can therefore be  
 omitted. The supporting member also pro-  
 vides a connection to the padded member  
 and, via the supporting rod, secures the  
 padded member to the back rest of a seat.

A special advantage of the invention is  
 that a padded member is required only on  
 the side of the head-rest facing the passenger,  
 i.e. the padded member needs to have not  
 more than 50% of the hitherto-required  
 volume of padding, which considerably re-  
 duces expense. Another advantage of the  
 invention is that the padded members used  
 can now be manufactured by a wide variety  
 of processes, provided they have the required  
 springiness or the desired softening effect.  
 Any faults in manufacture result in rejection  
 only of the padded member, since it does  
 not need to be manufactured simultaneously  
 with the supporting member but is preferably  
 secured thereto afterwards. The supporting  
 member likewise, owing to its one-piece con-  
 struction, is much cheaper to manufacture  
 than a multiple-part insert particularly if,

according to another preferred feature of the invention, the supporting member is an injection moulding made of a thermoplastic material, e.g. ABS, PPO or EPDM. A moulding of this kind, made of semi-rigid plastics, can be manufactured inexpensively, i.e. without machining, and gives a surface which completely meets aesthetic requirements. Further, no finishing treatment is required.

Advantageously, the supporting member is formed with a socket for the supporting rod, the socket being horizontal and receiving the central portion of the U-shaped supporting rod. This socket can also be self-retaining. Alternatively, according to another preferred feature of the invention, the central portion of the supporting rod is retained in the socket by a securing element which is fixed by screws to the supporting member.

Since, in principle, the head-rest must not have any projecting parts, the supporting member may be formed with a chamber extending inwardly towards the padded member, the chamber wall immediately adjacent the padded member being formed, a semi-circular slot constituting the socket, the two lateral end regions of the chamber being constructed as downwardly open channels for receiving the end portions of the supporting rod, and the securing element being inserted and screwed into the chamber. This feature eliminates projecting parts and greatly simplifies the mounting of the supporting rod, since it is only necessary for the free ends of its end portions to be inserted from above into the chamber and guided through the channels, after which the securing element is screwed on and the supporting rod is reliably secured to the supporting member.

The comfort of driving can be increased if the inclination of the padded member is adjustable. This can be obtained by suspending the unit comprising the padding member and the supporting member. Accordingly, in a preferred form of construction, the supporting member has a maximum pivoting radius of  $45^\circ$  and is pivotably mounted on the central portion of the supporting rod, and the channels widen downwardly and have pivot-limiting end abutments which limit the pivotal movement of the supporting member. At least those pivot-limiting end abutments which are most heavily loaded are formed with reinforcing ribs.

According to another preferred feature, the securing element inserted in the chamber has its exterior flush with the exterior of the supporting member so that it substantially closes the chamber from the exterior and has a number of webs which abut the central portion of the supporting rod and form a friction brake having a torque which is adjustable by means of the screws which attach the securing element to the support-

ing member. The webs have hollow round recesses at their ends which positively engage the central portion of the supporting rod.

By means of the friction brake, the padded member can be adjusted at any required inclination and secured. On the other hand, the friction force is small enough for the padded member to pivot out of its rear end position in the event of an impact. Expense is also saved by forming the securing element with webs constituting the friction brake, since the securing element, like the supporting member, can be an injection moulding of thermoplastic material, e.g. ABS, FPO or EPDM, without machining.

The securing element preferably has three inwardly-extending, outwardly-open sleeve-like recesses with holes at their bottoms, the recesses being shorter than the webs and being disposed under the central member portion of the supporting rod and opposite the holes in the bearing member. Self-tapping screws are inserted into the sleeve-like recesses and are screwed into the holes, preferably with a self-cutting thread. The braking torque can then be adjusted by varying the depth to which the screws are screwed in.

The padded member can be pressed into the supporting member and non-positively secured thereto. According to an additional or alternative feature, however, the padded member has a peripheral recess in which the end edge region of the supporting member is engaged.

According to another feature, the supporting member is formed with a number of internally-projecting bushes which project into the back of the padded member. The padded member can also comprise a shaped foamed plastics member having undercut recesses which receive barbed projections formed on the supporting member. All these features, either alone or in combination, result in a particularly simple connection between the padded member and the supporting member, since only a plug-and-socket connection is required.

As previously mentioned, the padded member for the head rest according to the invention can be manufactured in a number of ways. For example, the padded member can be a soft PVC injection-moulding formed with padded ribs, or it can have a rotated, foamed skin. Alternatively, the padded member can have a deep-drawn, foamed skin (plastics film), or it can be a block of foam rubber providing with a coating.

The main advantages of the invention are that the expensive insert can be omitted as a result of the half-shell structure of the head-rest, wherein the half-shell takes over the supporting function of the insert and is formed with elements such as sockets, end

abutments or the like. There is also an approximate 50% saving in material, more particularly padding, and the method of assembly is particularly rapid and simple. In addition, the head-rest according to the invention has an attractive appearance, satisfies technical requirements in the optimum manner and, not least, is very light.

An example of a head-rest in accordance with the invention is shown in the accompanying drawings, in which:—

Figure 1 is a rear view of the head-rest;

Figure 2 is a side view of the head-rest of Figure 1;

Figure 3 is a section along line A—A in Figure 1;

Figure 4 is a section along line B—B in Figure 1; and

Figure 5 is a section corresponding to Figure 3, except that the padded member is different.

Basically, the illustrated head-rest comprises a supporting member 1 secured to a padded member 2 and a supporting rod 3.

The supporting member 1 is basically constructed as a unitary dish-shaped injection moulding of synthetic thermoplastic material. It has a smooth or grained surface which completely meets aesthetic requirements, and a suitably soft springy shape. All projecting parts are deliberately eliminated. In the lower third of the supporting member 1 there is an elongate chamber 4 extending inwardly towards the padded member 2.

The rear wall 5 of chamber 4 is formed with a socket 6 in the form of a part-circular groove, which receives the supporting rod 3. The two lateral end regions of chamber 4 are continued in the form of downwardly-open ducts 7. The duct walls diverge downwardly and form end abutments 8, 9 at an angle of about 45° to one another. As Figure 4 shows, end abutment 9 is reinforced by ribs 10.

The supporting member 1 is formed with internal webs 11 and twelve sleeve-like projections 12 extending into padded member 2, at positions 12a. In Figure 5, the projections 12 end in barbs 13 and the end regions have slots 14, so that projections 12 can be secured at their ends by radial contraction. Three horizontally-spaced holes 15 are formed adjacent socket 6. Near each hole 15, the rear wall 5 has a thickened portion 16, providing sufficient material for the screws 17 to be inserted into the wall 5.

By means of screws 17, a securing element 18 inserted into chamber 4 is secured to member 1, which in turn secures the supporting rod 3 in socket 6. Rod 3 is U-shaped and comprises two end portions 19 joined by a central portion 20. In order to secure central portion 20 in socket 6, the element 18 is formed with webs 21 engaging the surface of central portion 20, with circumferen-

tial grooves 22. Grooves 22 overlap regions of central portion 20. Webs 21 of element 18 are used for retaining purposes and, more particularly, they form a friction brake having an adjustable braking torque. The required braking torque can be adjusted, via screws 17, by varying the tightening of element 18 in the direction towards the rear wall 5. Owing to the special construction of rod 3 and the manner in which it is secured to member 1, member 1 and the padded member 2 carried thereby are given a rocking suspension, i.e. member 1 can be pivoted backwards and forwards within the angle defined by abutments 8 and 9. Since, however, a loose bearing is not usually desirable, the pivoting resistance can be determined by means of the friction brake. Advantageously, the head of each screw 17 is disposed above a hole 23 at the bottom 24 of an outwardly open, sleeve-like recess 25 in element 18. Consequently, since the height of recess 25 is less than that of webs 21, the braking torque can be adjusted at any time. As shown in the drawings (Figures 2—5), the outside of the securing element is substantially flush with the outside of supporting member 1.

In Figures 3 and 4, the padded member 2 is a soft PVC injection-moulding formed with padded ribs 26. The padded member has a peripheral pocket-like recess 27, into which is inserted an end edge region of supporting member 1. In addition, of course, a retaining adhesive can be used, i.e. inserted into recess 27 and/or applied to the edge region of member 1. In addition, projections 12 are used for holding member 2, by receiving or being surrounded by padded ribs 26. Accordingly, members 1 and 2 are simply placed together and firmly secured by screw fastening and also, if required, by an adhesive. The free end of ribs 26 bear against wall 5 and against a board insert 28 or the like in member 1.

In Figure 5, the padded member 1 is a rotated or deep-drawn skin which is foamed underneath. The foam 29 embeds an injection-moulded plastics dish 30 formed with undercut recesses 31 aligned with barbs 13 on sleeve-like projections 14 from member 1. In this embodiment also, member 1 can be secured to member 2 by a plug-in connection only. Owing to the barbs 13, no adhesive is necessary.

Similarly, the structural unit comprising members 1 and 2 can be easily and rapidly secured to the supporting rod 3, simply by inserting the free ends of the side members from above into chamber 4 and through ducts 7 until the central portion 20 enters socket 6. Thereupon, element 18 is inserted into chamber 4 and secured by screws 17. The resulting finished head-rest is vertically adjustable in conventional manner when

secured to the back rest of a seat in a vehicle.

# WHAT WE CLAIM IS:—

1. A head rest for fitting to the back rest of a seat in a vehicle comprising a padded member constituting the front part of the head rest, a unitary concave supporting member constituting the back part of the head rest, the concavity of the supporting member facing the padded member, a groove around the back of the padded member in which the front edge of the supporting member is received, means securing the padded member to the supporting member, and a supporting rod received by the supporting member by which the head rest is supported.
2. A head rest according to claim 1, in which the supporting member is a thermo-plastic injection moulding.
3. A head rest according to claim 1 or claim 2, in which the supporting member is formed with a socket for the supporting rod, the socket being horizontal and receiving the central portion of the U-shaped supporting rod.
4. A head rest according to claim 3, in which the central portion of the supporting rod is retained in the socket by a securing element which is fixed by screws to the supporting member.
5. A head rest according to claim 4, in which the supporting member is formed with a chamber extending inwardly towards the padded member, the chamber wall immediately adjacent the padded member being formed with a semicircular slot constituting the socket, the two lateral end regions of the chamber being constructed as downwardly open channels for receiving the end portions of the supporting rod, and the securing element being inserted and screwed into the chamber.
6. A head-rest according to claim 5, in which the supporting member has a maximum pivoting radius of 45° and is pivotably mounted on the central portion of the supporting rod, and the channels widen downwardly and have pivot-limiting end abutments which limit the pivotal movement of the supporting member.
7. A head-rest according to claim 6, in

which at least those pivot-limiting end abutments which are most heavily loaded are formed with reinforcing ribs.

8. A head-rest according to any one of claims 5 to 7, in which the securing element inserted in the chamber has its exterior flush with the exterior of the supporting member so that it substantially closes the chamber from the exterior and has a number of webs which abut the central portion of the supporting rod and form a friction brake having a torque which is adjustable by means of the screws which attach the securing element to the supporting member.

9. A head-rest according to claim 8, in which the webs have hollow round recesses at their ends, which positively engage the central portion of the supporting rod.

10. A head-rest according to claim 8 or claim 9, in which the securing element has inwardly extending, outwardly open sleeve-like recesses with holes at their bottoms, the recesses being shorter than the webs and being disposed adjacent the central portion of the supporting rod and opposite holes in the supporting member.

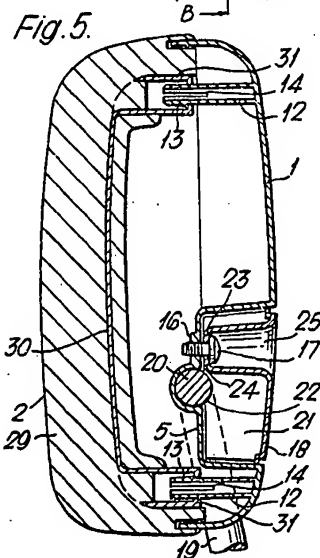
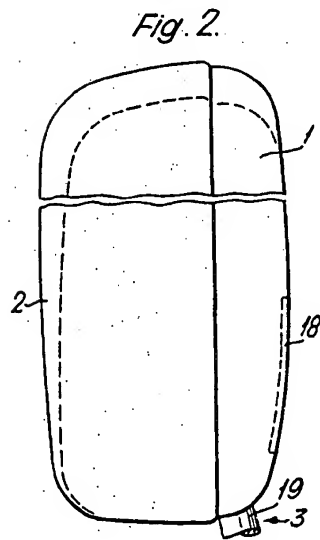
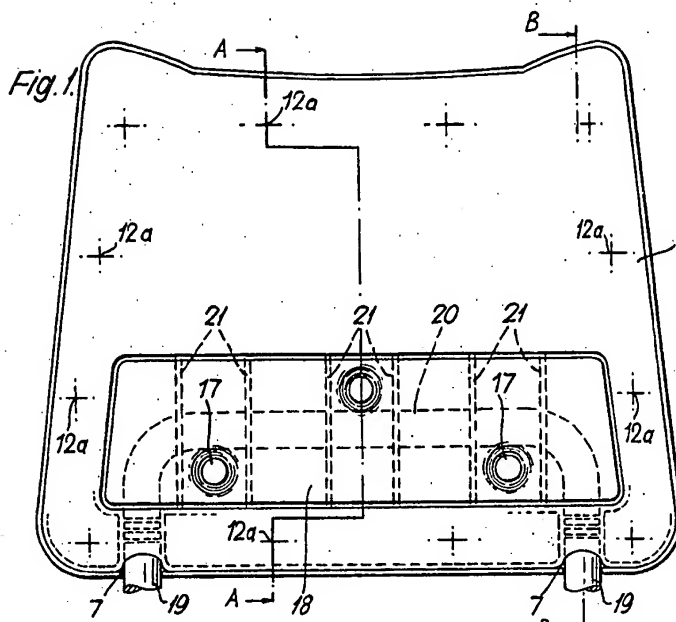
11. A head-rest according to any preceding claim, in which the supporting member is formed with a number of internally projecting bushes which project into the back of the padded member.

12. A head-rest according to any preceding claim, in which the padded member comprises a shaped foamed plastics member having undercut recesses which receive barbed projections formed on the supporting member.

13. A head-rest according to any preceding claim, in which the padded member is a soft PVC injection-moulding formed with padded ribs, or a rotated or deep-drawn foamed skin, or a block of foamed rubber provided with a coating.

14. A head-rest for fitting to the back rest of a seat in a vehicle, constructed and arranged substantially as herein described, with reference to and as illustrated in the accompanying drawings.

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1592141  
2 SHEETS

COMPLETE SPECIFICATION  
This drawing is a reproduction of  
the Original on a reduced scale  
Sheet 2

